Annual Energy Outlook 2013
Preliminary Reference Case Results for Natural Gas

Office of Petroleum, Natural Gas and Biofuels Analysis
Administrator Briefing
October 2nd, 2012  |  Washington, DC
WORKING GROUP PRESENTATION FOR DISCUSSION PURPOSES
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AEO2013P uses ref2013.d100312b
AEO2012 uses ref2012.d020112c
Changes for AEO2013

• Revised shale & tight play resources (EURs, type curves)
• Updated classification of shale gas, tight gas, & tight oil reservoirs
• Updated offshore announced discoveries
• Updated assumptions for Canada
• Estimated world natural gas prices in order to endogenously model LNG exports
• Updated methodology for calculating the Henry Hub price
• Updated historical data and related parameters
Shale gas has been the primary source of recent growth in U.S. technically recoverable natural gas resources.

Source: Preliminary AEO2013 runs, dated as of 10/03/12
AEO2013 shale plays of interest (Tcf)

<table>
<thead>
<tr>
<th>Shale Formation</th>
<th>AEO2013</th>
<th>AEO2012</th>
<th>USGS</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Unproved shale gas resources</td>
<td>Undiscovered</td>
<td></td>
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<tr>
<td>Eagle Ford</td>
<td>55</td>
<td>50</td>
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<tr>
<td>Marcellus</td>
<td>148</td>
<td>141</td>
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<tr>
<td>Haynesville</td>
<td>75</td>
<td>66</td>
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<tr>
<td>Fayetteville</td>
<td>16</td>
<td>13</td>
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<tr>
<td>Woodford</td>
<td>34</td>
<td>24</td>
<td>26</td>
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<tr>
<td>Utica</td>
<td>38</td>
<td>16</td>
<td>38*</td>
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</table>

* USGS assessment released September 27, 2012.

Note: These numbers are dry. In general EIA natural gas and oil resource tables do not include natural gas plant liquids, but do include condensates.
Natural gas consumption, production, and imports, 1990-2040

trillion cubic feet

History

Consumption

Production

Projections

Net Imports

Net Exports

Source: Preliminary AEO2013 runs, dated as of 10/03/12
Net U.S. imports by source, 1990-2040

Source: Preliminary AEO2013 runs, dated as of 10/03/12
LNG Exports Reference Case, 2015-2040

Source: Preliminary AEO2013 runs, dated as of 10/03/12
LNG Exports High Price Case, 2015-2040

billion cubic feet per day

Source: Preliminary AEO2013 runs, dated as of 10/03/12
Henry Hub and National Average Price, 1990-2040

2011 dollars per million Btu

History

Projections

Source: Preliminary AEO2013 runs, dated as of 10/03/12

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Washington, DC, October 4, 2012

DO NOT QUOTE OR CITE as results are subject to change
Henry Hub Natural Gas Spot Prices, 1995-2040

2011 dollars per million Btu

History

Projections

- AEO2013P
- - - AEO2012

*CERA: August 2012, IHS CERA North American Natural Gas Outlook Data Tables
Source: Preliminary AEO2013 runs, dated as of 10/03/12
Ratio of low-sulfur light crude oil prices to natural gas prices on an energy-equivalent basis, 1995-2040

Source: Preliminary AEO2013 runs, dated as of 10/03/12
Natural Gas End-Use Prices by Sector, 1990-2040

2011 dollars per thousand cubic feet

History Projections

- Transportation
- Residential
- Commercial
- Industrial
- Electric Power

Source: Preliminary AEO2013 runs, dated as of 10/03/12
Natural gas consumption by sector, 1990-2040

trillion cubic feet

History

Projections

Industrial*

Electric Power

Residential

Commercial

Transportation**

* Includes lease and plant fuel, and natural gas-to-liquids heat, power, and production
** Includes pipeline fuel

Source: Preliminary AEO2013 runs, dated as of 10/03/12
Shale gas production growth and leads to net exports

Source: Annual Energy Outlook 2012
Shale gas production growth and leads to net exports

Source: Preliminary AEO2013 runs, dated as of 10/03/12
Lower 48 conventional non-associated natural gas production, 1990-2040

Source: Preliminary AEO2013 runs, dated as of 10/03/12
Lower 48 conventional non-associated natural gas production, 1990-2040

trillion cubic feet

History Projections

--- AEO2013P
--- AEO2012

Shale Gas
Tight Gas
Coalbed Methane

Source: Preliminary AEO2013 runs, dated as of 10/03/12
Shale gas production by play

trillion cubic feet

Source: Preliminary AEO2013 runs, dated as of 10/03/12
Natural gas wells drilled versus natural gas Henry Hub price

natural gas Henry Hub price
2011$/MMBtu

natural gas wells drilled

History

Projections

Note: Prior to 1990, wellhead natural gas price data are used.
Source: Preliminary AEO2013 runs, dated as of 10/03/12
Natural Gas Plant Liquid Production, 2000-2040

Million barrels per day

History

Projections

AEO2013P

AEO2012

Source: Preliminary AEO2013 runs, dated as of 10/03/12
Additional AEO2013 cases

• High/Low World Oil Price
• High/Low Macroeconomic Growth
• High/Low Resources
  • TAPS Cases
  • High/Low Oil and Gas Technology
  • High/Low LNG Exports
For more information


Short-Term Energy Outlook | www.eia.gov/steo

Annual Energy Outlook | www.eia.gov/aeo

International Energy Outlook | www.eia.gov/ieo

Monthly Energy Review | www.eia.gov/mer

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(202) 586-8800

24-hour automated information line about EIA and frequently asked questions.
## Lower 48 unproved shale gas resources

### trillion cubic feet

<table>
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<tr>
<th>Region</th>
<th>Basin</th>
<th>Play</th>
<th>AEO2013P</th>
<th>AEO2012</th>
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<td>Appalachian</td>
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<td>Devonian - Big Sandy Central</td>
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<td>Devonian - Greater Siltstone</td>
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